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BEES OF THE GENUS CŒLIOXYS IN THE COLLECTION OF THE CALIFORNIA ACADEMY OF SCIENCES

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1. Cœlioxys coquilletti Crawford

Females. California: Coronado, August 3 (Blaisdell); San Diego, August 23 (Blaisdell) South Sonoma County, October 6 (Kusche); Santa Cruz, November 4 (Van Duzee).

Males. California: Sacramento, May 27 (Van Duzee). This seems to be the male of *C. coquilletti,* although the femora are black and the tibiæ suffused with black; the spurs are very light ferruginous. The fourth abdominal sternite is produced and shining at end, but dark, rounded, and not emarginate. There are two small spots of white hair in the scutello-mesothoracic sutures, as in the female.

2. Cœlioxys novomexicana (Cockerell)

Females. Arizona: Cochise County, June 26 (V. W. Owen). California: Mokelumne Hill, September (Blaisdell); Oak Glen Lodge, San Bernardino County, 5000 feet, July (F. C. Clark); Stockton, August 20 (Van Duzee); Sobre Vista, Sonoma County (Kusche).

Males. Arizona: Cochise County, June 26 (V. W. Owen).

3. Cœlioxys menthæ Cockerell

Females. Arizona: Cochise County, June 26 (V. W. Owen).

4. Cœlioxys texana Cresson

Female. Arizona: Cochise County, June 26 (V. W. Owen).*

*This is the genuine *C. texana.* For many years I have had in my collection a species collected by Dr. S. Graenicher in Washington County, Wisconsin, July 23, 1907, and determined by him as *C. texana.* I had uncritically accepted this determination, but the insect is really quite different, and may be separated thus:

Coelioxys wisconsinensis Cockerell, n. sp. Female (type) about 12 mm. long, black, less robust than *C. texana,* the abdomen conspicuously more slender, and the long last ventral segment, which is fringed with long (short in *texana*) hairs at sides, much more pointed, acute, more as in *C. hunteri* Crawford. Other differences are as follows: scape more slender, antennæ entirely black; clypeus less densely punctured, less hairy; supraclypeal region with a prominent median polished ridge; meso-

5. Cœlioxys rufitarsis Smith

Females. Utah: Salt Lake City, July 1 (Van Duzee). California: Shasta County, July 23 (Kusche).

Males. Utah: Salt Lake City, July 1 (Van Duzee); Logan, July 18 (Van Duzee); Park City, July 3 (Van Duzee); Lagoon, June 30 (Van Duzee). Oregon: Wallowa Mountains, Baker County, July 5 (Van Dyke). Washington: Wawawai (W. M. Mann). The Lagoon specimen is very remarkable in having apparently hairless eyes; with a microscope it is possible to see a very few hairs, including one long one on the left eye. Possibly the eyes are denuded, but I think we have a bare-eyed mutation.

6. Cœlioxys rufitarsis rhois Cockerell

Females. Utah: Logan, July 15 (Van Duzee). Oregon: Colestin, Jackson County, July 30 (Van Duzee). On account of the black tegulæ these fall with *rhois,* but in all the terminal lobe of the apical ventral segment is distinctly narrower than in the type of *rhois* from the White Mountains of New Mexico. Also, the hair on the eyes is white, whereas in type *rhois* it is pale yellowish. Thus, although the Utah and Oregon specimens cited belong to *rhois,* as defined by Crawford, it might be better to use that name in a much more restricted sense. The Logan male (see above) has dark reddish tegulæ.

7. **Cœlioxys rufitarsis claripes** Cockerell, subsp. n.

Male. Femora strongly stained with red above; tibiæ and tarsi entirely red, antennæ entirely black; eyes with long hair.

Type, male, No. 1633, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, June 6-12, 1917, at **Keen Camp, Riverside County, California.**

8. **Cœlioxys mediata** Cockerell, n. sp.

Female. I had this mixed with *C. rufitarsis rhois,* but it is easily separated by the hair on the eyes, which (as in *C. coquilletti*) is only about half as long, and is pure white. It is smaller

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thorax less densely punctured; hair-marks of thorax above entirely white; axillar spines smaller; scutellum shorter and more rounded; femora with some blackish suffusion behind; basin of first abdominal segment with a sharp margin, behind which is a white hair-band, failing in middle. The tarsi are black, the hind pair with orange pubescence on inner side.

The male is given in my table in Canad. Entomologist, June, 1912, as *C. texana.* The color of legs and other features separate this from *C. alternata* Say.

than *rhois,* with green eyes, shorter and more curved axillar spines, and much narrower apical lobe of last ventral segment. It differs from *C. coquilletti* by the black (or very faintly reddish) tegulæ, and femora black except at apex. The abdomen is entirely black, above and beneath; the fifth segment is entirely minutely granular, except basally where there are some fairly distinct punctures. The first dorsal is not densely punctured above as it is in *coquilletti.* The insect is thus between *coquilletti* and *rufitarsis;* possibly to be regarded as a race of the former. From *C. angulifera* Ckll., it is at once known by the angular projections at sides of last dorsal segment.

Male. California: Millbrae, September 1, 1912 (F. E. Blaisdell). Looks like the male of *C. rufitarsis,* but easily separated by the short hair on eyes. The tibiæ are black except at apex, the tarsi bright ferruginous. The margin of fourth abdominal sternite is evenly rounded.

Type, female, No. 1634, Mus. Calif. Acad. Sci., collected by Dr. E. C. Van Dyke, September 1, 1912, at **Millbrae, California.**

9. Cœlioxys gilensis Cockerell

Female. California: Cayton, Shasta County, July 9 (Van Duzee).

10. Cœlioxys deani Cockerell

Females. California: Bear Valley, San Bernardino County, August 17 (F. C. Clark); South Fork Kings River, July 8 (Van Dyke). This species is smaller than *C. gilensis,* and has the first recurrent nervure joining the second cubital cell very near the base, or even meeting the intercubitus. Probably *C. deani* has a different host, but its status as a distinct species is rather doubtful.

Males. California: Bear Valley, San Bernardino Mountains, July and August (F. C. Clark); Kings River Cañon, Fresno County, July 2 (Van Dyke); Oak Glen Lodge, San Bernardino County, 5000 feet, July (F. C. Clark). In all these, the apex of abdomen is a little broader than in the type male of *C. deani.*

11. Cœlioxys apacheorum Cockerell

Female. Utah: King's Station, Davis County, July 24 (Van Duzee).

12. Cœlioxys moesta Cresson

Females. Utah: Daniels Cañon, Heber, July 5 (Van Duzee). California: Fallen Leaf Lake, July (L. S. Rosenbaum). A very widely distributed and variable species; known from the allied *C. porteræ* Ckll. by the very short axillar spines. From *C. angulifera* Ckll. it is known by the much shorter axillar spines, grooves not continuous across second and third abdominal segments, much longer hair on eyes, etc.

13. Cœlioxys ribis Cockerell

Females. California: Strawberry Valley, El Dorado County, August 14 (Van Dyke); Kings River Cañon, Fresno County, July 8 (Van Dyke).

Male. (No locality label) collected by Dr. Van Dyke.

14. Cœlioxys ribis kincaidi Cockerell

Male. British Columbia: Nanaimo Biological Station, June 28 (Van Duzee).

15. Cœlioxys angulifera Cockerell

Male. California: Paradise Valley, Fresno County, July 15 (Van Dyke).

16. Cœlioxys megatricha Cockerell

Males. California: Coronado, September 15 (Blaisdell); hills back of Oakland, August 2 (Van Dyke). The lower apical teeth of the abdomen are less divergent than in the type, but the species is certainly the same.

17. Cœlioxys fragariae Cockerell

Male. California: Cascada, Fresno County, 6000 feet, July 29 (Van Duzee).

18. Cœlioxys deplanta Cresson

Males. California: Millbrae, September 1 (Van Dyke); Poway, San Diego County, May 20 (Blaisdell). Utah: Salt Lake City, June 27 (Van Duzee).

19. Cœlioxys quercina Cockerell

Males. California: Huntington Lake, 7000 feet, July 27 (Van Duzee).

20. **Cœlioxys salinaria** Cockerell, n. sp.

Male. Length about 8.5 mm.; black, with white hair, dense and pure white on face; knees, tibiæ and tarsi bright ferruginous, femora

somewhat suffused with red; eyes light green, with short hair; antennæ entirely black; lower part of cheeks with a bevelled space; head and thorax above coarsely punctured, the punctures well separated on vertex, dense on mesothorax, but some shining surface showing in middle; hair-marks of thorax above weak, except white bands in front of and behind scutellum; scutellum not produced or tuberculate; axillar spines well developed, curved; tegulæ bright ferruginous; wings dusky at apex; stigma bright ferruginous, nervures fuscous; first recurrent nervure joining second cubital cell some distance from its base, and second a like distance from apex; anterior coxæ spined; spurs ferruginous; abdomen with white hair-bands, no basal one on first segment; transverse sulci of second and third tergites deep and entire; no foveæ on second segment; lateral and lower apical spines of abdomen slender and sharp; upper apical simple, much more divergent than lower; fourth ventral not bidentate. Apparently allied to *C. edita* Cresson, but distinguished by the color of the legs.

Type, male, No. 1635, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, July 1, 1922, at **Salt Lake City, Utah.** Paratype, one male, same data.

21. **Cœlioxys asclepiadis** Cockerell, n. sp.

Male. Length slightly over 9 mm.; black, including the antennæ, but tarsi dark red, and the femora and tibiæ reddish-black; pubescence very dense and pure white on face, mainly white on thorax and abdomen, but light yellowish along mesothorax anteriorly (thickened sublaterally, but not forming dentiform projections), and a spot of the same color behind tegulæ, and band in scutello-mesothoracic suture; eyes light brown, with short hair; head and thorax above coarsely and densely punctured; scutellum neither produced nor tuberculate; axillar spines stout, not very long; cheeks with a bevelled space below; mesopleura shining, punctured, bordered in front and behind with white hair; tegulæ black; wings dusky apically and a streak in marginal cell; stigma ferruginous, nervures fuscous; first recurrent nervure joining second cubital cell some distance from base; anterior coxæ with short spines; spurs red; abdomen with white hair-bands, first segment with an entire and very distinct basal one, which is slightly yellowish; transverse sulci on second and third tergites failing in middle; no foveæ on second segment; apex rather produced, with a very deep median sulcus; lateral and lower apical spines sharp; upper apical entire, very thick and blunt, not or hardly more divergent than lower; translucent apex of fourth tergite broadly emarginate, and before it a bright ferruginous patch. A pollen body of *Asclepias* is attached to the left hind leg of the type.

Resembles *C. angelica* Ckll., but easily separated by the broader axillar spines, fulvous tint of hair-markings on thorax above, first recurrent nervure remote from intercubitus, etc.

Type, male, No. 1636, Mus. Calif. Acad. Sci., collected by Virgil Owen, June 26, 1916, in **Cochise Co., Arizona.** Presented to the Academy of Sciences by Mr. J. E. Law.

22. **Cœlioxys hypodonta** Cockerell, n. sp.

Male. Length about 11 mm.; black, including legs and antennæ, the tarsi refuscent at apex; fourth and fifth abdominal tergites rufous basally; tegulæ dark rufous; pubescence white, dense on face; eyes pale green, with long hair; cheeks with a bevelled space below; head and thorax above densely and coarsely punctured; scutellum neither produced nor tuberculate; axillar spines stout, moderately curved, not very long; mesopleura covered with long hair; wings slightly reddish, stigma and nervures ferruginous; first recurrent nervure remote from intercubitus; spurs dark; hair on inner side of hind tarsi light yellow; hind edge of first abdominal segment very narrowly red; sulci across second and third segments deep and entire; foveæ on second segment transversely oval, quite large, without an impunctate margin; no distinct spines at sides of fifth segment; spines at sides of sixth well developed, but blunt; lower apical spines long, slender, parallel, rather wide apart, not sharply pointed; upper apical spines about half as long, stout, rounded, more divergent than lower; fourth ventral segment with an acutely bidentate process; fifth with an expanded hyaline margin.

Very distinct by the abdominal characters.

Type, male, No. 1637, Mus. Calif. Acad. Sci., collected by Mr. L. S. Rosenbaum, in July, 1915, at **Fallen Leaf Lake, California.**

In Annals Entom. Soc. America, June, 1914, Crawford gives a very good table for the separation of female *Cœlioxys,* and I gave a table of females in Psyche, October, 1905. The males recorded above are not so easily separated, so I offer a new table, as follows:

Legs red 1
Legs black, with tarsi, and sometimes also tibiæ, red 5
Legs black 10

1. With linear transverse foveæ on second abdominal tergite behind groove 2
   Without linear transverse foveæ on second abdominal tergite; hair of eyes short; tegulæ bright ferruginous 3
2. Anterior femora mainly clear red; axillar spines long; tegulæ bright ferruginous ..... *megatricha* Ckll.
   Anterior femora black, red above; axillar spines shorter; tegulæ much darker ..... *rufitarsis claripes* Ckll.
3. Lower apical teeth of abdomen wide apart, upper ones bifid; axillar spines conspicuously curved; first recurrent nervure

entering extreme basal corner of second cubital cell.....
.....*quercina* Ckll.
Apical teeth of abdomen not unusually remote, upper ones blunt, not bifid..... 4

4. Antennæ partly reddish basally; axillar teeth large; second tergite with very small foveæ.....*novomexicana* Ckll.
Antennae wholly black; axillar teeth shorter; second tergite without foveæ.....*deplanata* Cresson

5. Foveæ on second abdominal tergite, behind transverse furrow, punctiform or absent; hair on eyes short..... 6
Foveæ on second abdominal tergite linear, transverse..... 7

6. Tegulæ clear red; upper apical spines of abdomen much more divergent than lower.....*salinaria* Ckll.
Tegulæ dark; upper apical spines of abdomen not more divergent than lower.....*asclepiadis* Ckll.

7. Hair on eyes long.....*rufitarsis* Smith
Hair on eyes short..... 8

8. Length over 11 mm.; anterior tibiæ black in front except at end.....*mediata* Ckll.
Much smaller; anterior tibiæ dark or bright red in front..... 9

9. Middle of second abdominal tergite, before groove, shining and sparsely punctured; no spots of light hair between mesothorax and scutellum.....*angulifera* Ckll.
Middle of second abdominal tergite, before groove, duller and densely punctured; two spots of light hair between mesothorax and scutellum.....*coquilletti* Crawford

10. Upper apical teeth of abdomen tridentate; no transverse foveæ on second abdominal tergite.....*fragariæ* Ckll.
Upper apical teeth of abdomen simple, not divided.....11

11. Large transversely oval foveæ on second abdominal tergite; hair of eyes long.....*hypodonta* Ckll.
No foveæ on second abdominal tergite.....12

12. Larger; hair of eyes long; tegulae black.....13
Smaller; hair of eyes short; tegulæ reddish.....*deani* Ckll.

13. Larger; hair of head and thorax above yellowish.....
.....*ribis kincaidi* Ckll.
Smaller; hair of head and thorax above dull white.....*ribis* Ckll.

In American Museum Novitates, No. 21 (1921) I remarked that the nearctic *Cœlioxys* species seemed to be usually restricted, or nearly restricted, to a single province. The present collection shows that many of the species are more widely distributed, and the California endemism which I expected to find exists only to a very limited extent. Thus, out of fourteen species represented in the collection from California, only two were undescribed.